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FACTORS CONTRIBUTING TO JOB FAILURE AMONG SHIPBOARD

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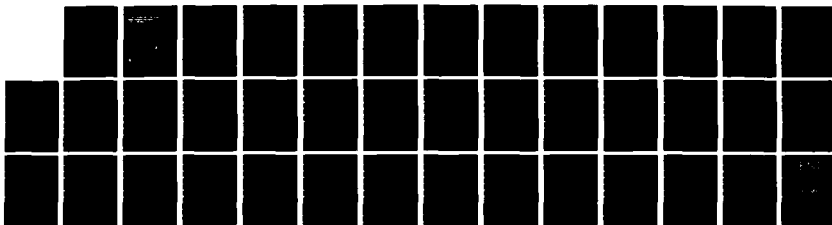
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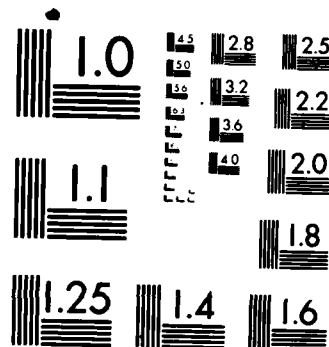
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**FACTORS CONTRIBUTING TO JOB FAILURE AMONG SHIPBOARD
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Factors Contributing To Job Failure Among Shipboard

Independent Duty Hospital Corpsmen

SUMMARY

The two objectives of this study were (a) to determine both the prevalence and causes of job failure among Navy shipboard independent duty technician (IDT) corpsmen, and (b) to identify possible methods to prevent or reduce IDT job failure. Data extracted from service records were analyzed for a sample of 58 controls and 37 IDT corpsmen job failures. Job failures were nominated by NMPC, EPMAC, and Force Medical Departments. The records of any corpsman on any list was reviewed for possible study inclusion.

The prevalence of job failures among Fleet IDT corpsmen was based on analysis of personnel transfer data during 1982 and 1983. The determination of causes for job failure was based entirely on analysis of service record entries. Other causal factors are currently under study using methodology other than service record review.

Identification of ways to prevent/reduce job failures focused on three methods: applicant screening, post-training job assignment, and on-the-job remedial assistance. Potential screening and assignment criteria were identified by examining four types of background data: (a) demographic characteristics, (b) context and type of duty assignments, (c) training background, and (d) performance history. The feasibility of more timely remedial technical assistance was explored by examining trends in performance.

Prevalence and Causes of Job Failure

Based on the number of verifiable performance-related reliefs during 1982 and 1983, the prevalence of IDT job failure was estimated to be between 5 and 7% per year. Basic causes of performance-related relief were either inspection failures (38%), dishonorable conduct (32%), or problems in dealing effectively with superiors (30%). Also at the actual time of job failure, performance marks emphasized both inflexibility and unreliability.

The demographic backgrounds of ineffective corpsmen did not differ significantly from controls, nor did they differ with respect to amount of training, types or contexts of job experience, nor basic demographic characteristics; with one exception--rank. Ineffective corpsmen were more likely to be junior in rank at time of reporting for IDT duty, i.e., E-6 versus E-7.

IDT Corpsman Screening

IDT corpsman job-failures exhibited significantly more pre-application instances of substandard performance and fewer instances of outstanding performance

than controls who were not relieved. An instance of substandard performance was defined as one or more marks of 3.0 or less on any single performance evaluation.

IDT Corpsman Assignment

Fifty-two percent of job failures were in the bottom 25% of their graduating class. Currently, post-IDT job assignment takes place long before corpsmen are near completion of school. Therefore, unless a student becomes an academic failure, he is presumed to be prepared for shipboard duty. In addition, assignments are based on standard Navy sea/shore rotation, which results in half the IDT graduates being sent to shore billets. It is therefore possible, although perhaps not using current procedures, to either raise standards for minimally acceptable training performance, or to continue current standards, and make shipboard assignment decisions on the basis of demonstrated mastery of skills during training.

Shipboard Remedial Assistance

A significant deteriorating trend in performance was found among ineffective corpsmen as early as three reports prior to job failure. Despite technical assistance having been available, many IDT job failures either failed to request assistance, or received it too late. This significant performance deterioration suggests that closer supervision of corpsman performance could permit Force Medical Departments to identify problems, and to intervene early enough to reduce the likelihood of corpsman failure.

Recommendations

Either screening that focuses on instances of substandard performance or assignment based on IDT class standing, i.e., the top three quarters of their IDT class would produce similar estimated reductions in the job failure rate from 5 to 7% to about 3 to 5%. However, if practical, implementation of both pre-training performance screening and assignment of only top students to shipboard duty is recommended.

Increased performance supervision of IDT corpsmen in the fleet would permit earlier introduction of technical assistance aimed at preventing job failures. Finally, E-6 IDT corpsmen should be assigned to smaller units, and units that have not had a recent history of problems with their medical department.

FACTORS CONTRIBUTING TO JOB FAILURE AMONG SHIPBOARD
INDEPENDENT DUTY HOSPITAL CORPSMEN

BACKGROUND

The shipboard independent duty technician (IDT) Hospital Corpsman (HM) is at the forefront of Fleet health service delivery. Typically a mid-career enlisted man, the IDT corpsman serves in lieu of a physician aboard the majority of Fleet surface and submarine units. As the Senior Medical Department Representative, the IDT corpsman is primarily responsible for providing direct patient care to the crew. Consequently, the independent duty corpsman must possess clinical skills adequate to the identification and treatment of common illness and occupational injuries. Moreover, he must be able to determine the requirement for evacuation to a physician's care, or for post-treatment follow-up consultation once in port.

Over the years, the role of the IDT corpsman has grown in scope, especially in the area of preventive medicine. These responsibilities include: Ensuring timely inoculations and physical examinations; monitoring sanitation of the ship's messina and berthing facilities; providing training in first aid, health, and hygiene; and monitoring and reporting on epidemiology and industrial exposure to contaminants, such as noise, heat, asbestos, and nuclear radiation. Also, the IDT corpsman manages his own medical supplies and equipment, he insures the material readiness of all the ship's stretchers, remote medical treatment sites, and first aid supply sites, and he insures that the entire crew is trained to cope in mass combat casualty situations.

The role of the shipboard IDT corpsman is highly demanding, both from a clinical as well as an administrative perspective. Clinically, he must sometimes function with complete autonomy in making critical medical decisions while at sea. An incorrect medical decision might result in a board of inquiry to investigate malpractice. Administratively, almost every inspection of the ship and its readiness involves a medical component. In some cases, such as radiation health and safety, an inspection failure by the ship's medical department can result in the ship being taken temporarily out of action, or in extreme cases, even relief of the commanding officer. Consequently, the broad responsibilities of the IDT corpsman place him under considerable pressure.

Recent research has reported that hospital corpsmen experience the highest incidence of stress-related illness in the Navy (Hoiberg, 1982). It is possible that the pressure associated with the autonomy and responsibility of the IDT corpsman could potentially lead to stress which might interfere with job effectiveness.

The Navy places a high priority on providing its forces with the best possible health care (Seaton, 1983). IDT corpsmen play a critical role in the Navy's efforts to provide quality health care to the Navy's front-line operating forces at sea. Any time an IDT corpsman fails to meet the demands of his job, it reduces the Medical Department's effectiveness in providing quality health care to the Fleet. Therefore, it is important to explore factors associated with IDT ineffectiveness, and to consider methods to prevent IDT job failures.

IDT Corpsman effectiveness can be defined in terms of job success or failure. Whenever a corpsman's performance becomes ineffective to the point that he must be relieved from duty, he becomes a job failure. By studying IDT job failures, it is possible to obtain information that can

be used in the improvement of IDT personnel selection, training, and assignment. These data also can help to suggest ways in which to improve the Fleet health care delivery system.

Prevalence and Causes of Job Failure

A first step in an examination of job failure among IDTs is to identify specific individuals who experienced a job failure. Such information can be used to estimate the prevalence rate of IDT job failure in the Fleet. In addition, careful study of each case can permit the identification of major causal factors associated with job failure, as well as a determination if job failures are more common in the surface or submarine force, or differ as a function of Atlantic or Pacific Fleet. The nature of causal factors resulting in failures may also suggest areas for change. This study will examine several corrective methods demonstrated by previous research to be helpful in preventing job failure.

Preventive Measures

In this study, methods to prevent IDT job failures focused, whenever possible, on practical measures that the Navy can implement in a straightforward manner. These consist of proven methods, demonstrated by past research to have the potential for improved job effectiveness. These practical, proven methods include expansion of IDT applicant screening, modification of training standards and/or job assignment procedures, as well as timely remedial intervention in the Fleet by Force Medical Department technical assistance teams.

Personnel Screening. Recently, Hunter and Hunter (1984) completed a statistical review of the job performance literature using a method known as meta analysis. Their review summarized previous reviews encompassing (a) 515 studies reviewed by Hunter (1980c), (b) 883 studies reviewed by Dunnette (1972), (c) 103 studies reviewed by Reilly and Chao (1982) and (d) 246 studies reviewed by Vineberg and Joyner (1982). Hunter and Hunter's report compared the validity of most common predictors of job effectiveness. The Hunters concluded that, when screening personnel for jobs involving new, but similar duties, measures that indicated consistency of performance were most valid. In addition, the review by Reilly and Chao (1982) provided a variety of evidence that supported the predictive validity of job experience, as well as demographic background information for predicting both job training success and job effectiveness. The results of these comprehensive reviews therefore, support as potential screening criteria for the selection of IDT applicants a research strategy based on review and analysis of service record information such as background data, job experience, and performance history.

At present, screening criteria for IDT training include an above-average general aptitude score (110), a minimum rank of E-5, a minimum of six years service, and the recommendation of an applicant's command (Catalogue of Navy Training Courses; CANTRAC/NAVTRA 10500). Except for the command endorsement, assignment officers may, at their discretion, relax any of these criteria in order to meet future billet requirements (NAVMILPERSCOMINST 1236.1B; 25 JAN 1983).

At the time this research was undertaken, there existed no formal review boards to assess factors such as disciplinary record, performance history, job experience, or training history, which might reflect on the suitability of applicants for the IDT job. Application materials are reviewed by a Chief Hospital Corpsman assigned to the Navy Military Personnel Command. Present policy

places the responsibility for establishing the qualifications of applicants on the endorsing commands; however, guidelines furnished in the Navy Enlisted Transfer Manual (NAVPERS 15909C) permit considerable discretion on the part of endorsing commands.

Even without an accurate estimate of the IDT job failure rate, the Navy Military Personnel Command was able to confirm that the large majority of IDT corpsmen do not undergo job failure.¹ It seems reasonable to assume, therefore, that IDT training is adequate to ensure that most corpsmen are successful. Such a fact does leave open the possibility that a percentage of job failures are due not to the quality of the training program, but are due to the quality of some of the personnel being trained. If the backgrounds of effective and job-failure corpsmen were found to differ significantly, it might be possible to reduce the number of IDT job failures by modifying the standards and/or procedures for screening IDT applicants.

Personnel Training and Assignment. Because IDT certification involves a lengthy training period of up to 12 months, it would seem that proficiency demonstrated during training might provide additional information useful in predicting job effectiveness. Vineberg and Joyner (1982) published a lengthy review which focused exclusively on studies of military personnel job effectiveness conducted over the past 15 years. They concluded that training performance and aptitude each demonstrated the highest overall ability to predict post-training on-the-job performance evaluation marks. Consequently, because service records contain information regarding aptitude and training performance, it is possible to examine both of these variables. However, training outcomes occur following applicant-selection. Therefore, any significant relationship between job effectiveness and training achievement would require modifications in standards or procedures for either training or assignment rather than for personnel screening.

According to the corpsman detailing office, the assumption is made that all IDT school graduates possess a minimal level of mastery of IDT job-related skills and knowledge.¹ Currently, the assignment of graduates from IDT training is based on a standardized sea-shore rotation cycle and an attempt to match billet openings with the anticipated graduation dates, the geographic location, and type of ship and/or duty preferred by each corpsman. In recent years, approximately 50% of IDT graduates in the surface force pipeline (NEC 8425) have been sent to shore billets² because, unlike their submarine force counterparts, 8425 IDT assignments must conform to the Navy's general sea/shore rotation policy.

Because of the critical nature of the shipboard IDT billet, and the fact that not all IDT graduates are assigned shipboard duty, it would be possible to base assignments on demonstrated mastery (not merely acquisition) of the skills necessary to function effectively. For example, academic failures in IDT training are rare, and current assignment policy does not take classroom proficiency into account. If a relationship between job failure and class standing were found to exist, then the Navy would be justified either in basing shipboard assignments on mastery of skills, as demonstrated by class standing, or in holding students to a higher standard of knowledge and skill mastery to qualify for an IDT NEC.

Technical Assistance. Some job failures might be prevented from occurring after corpsmen report for duty in the fleet. This would only be possible if some form of remedial intervention could be introduced before performance reached unacceptable levels. Current Force Medical Department on-the-job assistance is initiated either at the request of a ship (By the command or

the corpsman) or as a consequence of a periodic inspection failure. According to interviews with Surface and Submarine Medical Force Master Chiefs, most technical assistance visits occur following an inspection failure. The Master Chiefs also indicated that once an inspection failure has occurred, it is often too late to prevent a job failure. The effectiveness of technical assistance may be improved through more timely identification of problems, thereby permitting earlier introduction of preventive measures.

In order to determine whether earlier introduction of intervention is feasible, it would be necessary to determine whether job failure is a gradual process or a sudden, abrupt breakdown. If failures are precipitated by a detectable deterioration in performance, then increased monitoring for the signs of deteriorating performance would permit Force Medical Departments to initiate appropriate action in time to prevent job failures. If, on the other hand, job failures occur suddenly, then an impending job failure would not be signaled by deteriorating performance, and timely remedial assistance would not be feasible. The type of technical assistance appropriate for preventing job failure can be inferred, to some extent, from the causal factors associated with IDT job failures.

Summary of Objectives

The study had four objectives. The initial objective was to estimate the prevalence of IDT job failure in the Fleet, and to classify the principal reasons job failures occur. The remaining three objectives focused on the identification of possible methods for the prevention or reduction of job failure among Fleet IDT corpsmen. Specifically, the second objective was to examine background differences between effective and job-failure IDT corpsmen in order to identify any variables which could predict potential job failures. The third objective was to examine the relationship between job failure and IDT class standing in order to determine whether shipboard assignments should be restricted to top IDT trainees either through academic or personnel action. The fourth objective was to analyze performance trends preceding relief from duty in order to determine whether it would be possible to identify a potential job failure sufficiently early to prevent it through remedial assistance.

METHODS

The approach used in this research was archival. That is, data were derived primarily from the service record entries in personnel files maintained at the Navy Military Personnel Command (NMPC) in Washington. Target subjects consisted of all independent duty hospital corpsmen who underwent a job failure (performance-related relief from shipboard duty) during a target two-year period between January 1982 and December 1983, inclusive.

This two-year period was selected primarily for two reasons. First, because it is desirable to be able generalize results to the current situation in the Fleet, going back more than a few years might result in an invalid representation of factors affecting IDT job failures. Second, record data on performance-related reliefs prior to 1982 was unreliable primarily due to spotty availability.

It must be noted that information derived from service record entries is limited in application. The most valid use of such information is to address personnel screening and assign-

ment issues (Allport, 1942; Dunnette, 1962; Harding & Bottenberg, 1962; Owens & Henry, 1966; Owens 1976). Record entries cannot, for example, reflect adequately an individual's work environment, the adequacy of shore support, quality of training, ship's operational readiness, usefulness and appropriateness of inspections and drills, and a host of other factors that can impact on the performance and effectiveness of a corpsman. Other approaches are required to address such issues, and separate reports will consider IDT corpsman performance and effectiveness based on data appropriate to such questions.

Subjects

Deriving a valid list of IDT corpsman job-failures was not straightforward. One reason was that the Navy does not maintain a centralized ongoing list of the individuals who have been relieved for performance-related causes. Obtaining a valid list of IDT job failures was further complicated because the Navy makes a distinction between a "relief for cause" and an unprogrammed relief due to unacceptable performance. A "relief for cause" is a job failure that has been formally determined by the Enlisted Personnel Quality Review Board at NMPC. An unprogrammed relief, on the other hand, is any relief of a corpsman earlier than his normal projected rotation date (a period extending about three years from date of reporting aboard). However, unprogrammed reliefs can occur for a variety of reasons that may have nothing to do with unacceptable performance. Unprogrammed reliefs can include humanitarian transfers, transfers to attend officer candidate training, or to attend physician's assistant training, transfers due to illness or injury, as well as performance-related transfers.

Although relief for cause involves action by a formal review board, performance-related relief merely involves a ship's commanding officer requesting a replacement based on dissatisfaction with a corpsman's performance. If a command fails to follow up a performance-related relief by providing required supporting information, a formal determination by NMPC of "relief for cause" cannot be made.

Therefore, defining the study sample on the basis of a "relief for cause" designation seemed overly restrictive, because it could exclude many job failures on the basis of an administrative technicality. On the other hand, defining the sample as all unprogrammed reliefs would have included numerous cases that represented nonperformance-related factors, or actually signified outstanding performance (as in the case of officer or physician's assistant training). Consequently, lists of corpsmen relieved from duty prematurely for performance-related reasons were solicited from each of the Medical Administrative Departments of the four Force Commanders who initiate IDT relief actions (SURFPAC, SURFLANT, SUBPAC, and SUBLANT). Fleet information was cross-referenced with additional lists obtained from NMPC and the Enlisted Personnel Manpower Analysis Center (EPMAC).

The service records were drawn on any individual designated on any list as a performance-related relief. Final determination of performance-related relief cases was based on the criterion that the IDT corpsman was (a) relieved prematurely from shipboard duty, and (b) given a failing general performance mark of 2.8 or lower at the time of transfer from duty.

The initial pool of subjects consisted of 82 relieved IDT corpsmen. A total of 32 were excluded from this study because they were, in fact, reliefs for medical, humanitarian, or other

reasons which did not meet the two criteria stated in the previous paragraph. Also, some relief-for-cause cases were excluded. These included five corpsmen whose relief from IDT duty was related entirely to voluntary enrollment into substance abuse treatment with no evidence of significant performance decrement. One IDT corpsman was excluded because the relief context was not a ship. An additional 7 corpsmen were excluded because record data did not reflect a performance-related relief, although they had been designated as job failures by Force Medical Departments. Two of the 7 lacked a detaching performance evaluation or any other documentation reflecting, for the record, the circumstances surrounding the relief action. All the above cases were excluded primarily because it was desirable to confine analyses, as much as possible, to information typically available in NMPC personnel files, which are currently used to screen applicants. The final sample of job-failure corpsmen consisted of 37 IDTs who had served aboard ship for at least one reporting period prior to their performance-related relief from duty during 1982 or 1983.

In addition to the sample of job-failure corpsmen, a control sample was drawn by NMPC assignment officers. This group consisted of a sample of 15 IDT corpsmen from both the Surface and Submarine Forces in the Atlantic and Pacific Fleets. These corpsmen had served aboard ship during the period 1982 and 1983, but had either undergone a "due course" relief (i.e., regular end of tour rotation) or were still serving successfully as shipboard IDTs as of November 1983. In order to meet minimum constraints for valid statistical inferences, a minimum of 12 subjects per force was required to validly test for any differences caused solely by fleet or force differences (Cohen, 1977). Two subjects were excluded because of incomplete performance records which could not be replaced in a timely manner. The final control sample consisted of 58 subjects, 14 to 15 per force in each Fleet.

Table 1 presents a demographic breakdown of the backgrounds of the job-failure group compared to the control group. As can be seen, the only variable on which the two groups significantly differed was rank. The significant difference in rank between the job-failure and control groups, warranted an analysis of the possibility of sampling bias in selecting control subjects. This analysis compared the sample of controls to the distribution of rank among shipboard IDTs in the Fleet. A previous study, conducted by NHRC (Nice, 1984) provided a distribution of the pay grades of IDTs in the Fleet during the 1982-1983 time frame. Table 2 demonstrates that the current control group did not differ significantly on the basis of rank when viewed from a fleet-wide perspective. Therefore, it was concluded that the control group was representative of the Fleet. The implications of the rank difference between job failures and controls will be addressed in the results section of this paper.

Table 3 lists the major variables coded and examined in this research. Some variables considered for inclusion were omitted from further analysis due to difficulties in validly coding data, evidence of data unreliability, or lack of sufficient variance to permit valid inferences. Most of these variables are listed in Appendix A. Variables included in the present research can be divided into seven categories: demographic characteristics, job training, performance history, job experience, qualitative factors (e.g., reason for relief, prior health problem), and pre-relief IDT job performance marks.

Table 1

Backgrounds of Job Failures and Effective (Controls) Shipboard
Independent Duty Corpsmen Sampled for 1982 and 1983

<u>Job Failures</u> <u>Controls</u>			<u>Job Failures</u> <u>Controls</u>		
Race:			Dependents:		
White	80%	90%	None	13%	7%
Black	13%	5%	1	21%	29%
Other	7%	5%	2	18%	22%
			3	29%	22%
			4+	21%	20%
Marital Status:			Primary NEC:		
Married	68%	84%	8402	28%	48%
Divorced	16%	9%	8424	3%	4%
Single	16%	7%	8425	69%	48%
Basic Training:			"C" School Training:		
S. Diego	36%	52%	None	32%	24%
G. Lakes	49%	38%	1 Other	43%	48%
Orlando	13%	9%	2 Others	24%	24%
Other	3%	2%	3 Others	0%	3%
Corpsman Training:			IDT Training:		
Months			S. Diego	39%	35%
9-12	3%	8%	Portsmouth	41%	31%
12-18	60%	40%	Groton	21%	29%
18-24	15%	35%	Other	0%	5%
24-30	10%	10%			
30+	13%	7%			
Age During IDT Tour:			Aptitude (GCT/ARI or ASVAB):		
Under 35	79%	66%	Under 110	24%	22%
35 to 40	16%	30%	110 +	75%	78%
40+	5%	4%			
Rank:			Pre-IDT-Tour Time in Grade:		
HM1	87%	40%	Months		
HMC	13%	60%	1-24	39%	30%
			45-45	33%	34%
			46+	28%	36%
$\chi^2(1, N=93) = 21.8, p < .00001$					

Note. "Other" categories were not included in actual computation to insure a minimum of 5 subjects per cell, as suggested by Siegel (1956). They are reported for information purposes.

Table 2

Differences in Rank Between Effective (Controls) Shipboard
Independent Duty Corpsmen Sampled for 1982 and 1983
Compared to an IDT Fleet Census Conducted in 1983

Rank Comparison With PACFLEET

Rank	<u>PACFLT</u>	<u>Controls</u>
HM1	52%	40%
HMC	48%	60%

$$\chi^2(1, N=259) = 2.56, [ns]$$

Rank Comparison with Surface Fleet

Rank	<u>SURFLT</u>	<u>Controls</u>
HM1	42%	40%
HMC	58%	60%

$$\chi^2(1, N=156) = .08, [ns]$$

Note: SUBLANT did not participate in the MEDEVAC study (Nice, 1984). Consequently the data was examined first within the Pacific Fleet (PACFLT), for fleet-related differences, then within the surface force (SURPAC/LANT) to examine for force-related differences.

Table 3

Background Data Extracted From the Service Records of Job Failure
and Effective Shipboard Independent Duty Corpsmen

Sampled for 1982 and 1983

DEMOGRAPHICS:

Race
Marital Status
Number of Dependents
Aptitude (GCT/ARI or equiv.)
Rank at Time Reporting for
Duty on Target IDT Tour

JOB TRAINING:

Location of Basic Training
Number of "C" Schools Attended
IDT-Graduate Class Standing
Months Total HM Training
Location of initial IDT School

PERFORMANCE HISTORY:

Outstanding Performance:

Number of Navy Medals
Number of Commendations
Number of Honors (e.g.,
Sailor of Qtr.)

Substandard Performance:

Number of Pre-IDT Training Evals
With One or More Sub-
Standard Marks (< 3.0)
Number of Pre-IDT-Training Non-
Judicial-Punishments (NJPs)
and Court Martials

JOB EXPERIENCE:

Work Context:

Months Shipboard Duty
Months Hospital Duty
Months Clinic Duty
Months School Staff Duty
Months Field Medical Duty

Type Duties:

Months Clinical Experience
Months Admin Experience
Months Teaching Experience
Months Lab/Tech Experience
Months Misc Experience

PRE-RELIEF PERFORMANCE:

Performance Scores For Periods:

Three Evals Prior to Relief
Two Evals Prior to Relief
One Eval Prior to Relief
EVAL AT TIME OF RELIEF

QUALITATIVE FACTORS:

Reason(s) for Relief
Administrative Ability
Criticisms
Medical Judgment Criticisms
Overweight Problems
Marital Problems
Prior Health Problem(s)

Variables

Demographics. Demographic variables not commonly related to job effectiveness were coded for the primary purpose of insuring that the sampling procedures used to select a control group (effective corpsmen) did not result in any inadvertent bias that might affect results. These variables are listed in Table 3.

Training. Training background variables (Table 3) were limited to military training because these are most relevant to job performance and effectiveness measures (Curtis, 1971; Vineberg & Joyner, 1982). Other educational accomplishment is more commonly indicative of motivation and/or aptitude. Class standing at graduation from IDT training was included because training achievement has been shown to be predictive of future job performance among senior enlisted personnel (e.g., Stanlee & Abrahams, 1980).

Performance History. Performance history refers to instances of both outstanding and substandard performance. Performance history has been shown to relate to enlisted on-the-job performance and effectiveness (Vineberg & Joyner, 1983). Because outstanding performance evaluations of E-6 and above tend to be the rule rather than the exception (Thomas, 1968; Vineberg & Joyner, 1978, 1982, 1983), in the present study, outstanding performance was indicated by the number of awards received. Substandard performance was indicated both by disciplinary infractions (nonjudicial punishments and court martials) and instances of substandard periodic performance evaluation marks.

Because, as was reported earlier, job effectiveness is best predicted by consistency of performance rather than degree, such an approach was emphasized in this study. In the case of outstanding performance, awards in the Navy can take many forms, ranging in importance from formalized congratulations (meritorious mast) to a medal for valor (e.g., Navy Cross). No attempt was made to differentiate the status of awards. Each recorded instance of an award provided for an indicator that quantitatively would reflect the consistency of top performance, rather than the degree. This approach would also provide a simple, straightforward measure for use in routine screening procedures. Multiple occurrences of group awards (e.g., department battle efficiency "E") were counted only once within a single tour.

Substandard performance is normally indicated in one of two ways: (a) formal disciplinary action, and (b) negative performance evaluations. As in the case for awards, disciplinary infractions exhibit a range of importance from being late for work, to criminally prosecutable offenses. Navy personnel policy makes it unlikely that a corpsman prosecuted for a serious offense would have been retained and promoted, much less recommended by his command for IDT training. Therefore, coding the frequency rather than the degree of discipline problems was considered to provide one estimate of performance consistency. A second estimate of performance consistency included the frequency of substandard performance evaluation.

The number of instances of substandard performance was chosen rather than the cumulative number of each substandard mark given, or the average of actual marks across a man's entire career, for several reasons. First, obtaining mean performance scores across an entire career would be time-consuming, and therefore impractical for the Navy to use in conjunction with an applicant screening procedure. Second, using a single mean of all career performance scores ignores fluctuating trends that would reflect inconsistent or unreliable performance (Hunter & Hunter, 1984). Third, use of a

cumulative count of substandard marks versus instances of marks could under- or overestimate trends in performance based on the possibility that the number of categories (scores) chosen by a reporting senior to reflect substandard performance might be somewhat arbitrary. Therefore, both cross-career averages and cumulative counts of each substandard mark are less efficient estimators of consistent performance than counting the number of significant instances of poor performance in terms of one or more substandard mark per report.

The Navy converts performance evaluation scores to a 10-point system descending from 4.0 to 2.6 in increments of .2, with two additional categories of 2.0 and 1.0. Marks are assigned to a variety of performance dimensions on a yearly basis, and whenever an individual is transferred to a new command. Although a mark of 2.8 is considered unsatisfactory by the Navy, it is not customary to grade senior enlisted personnel below 3.4 except for serious dereliction or disciplinary infraction. This might be because special administrative justification is required for such grades (NAVMILPERSINST 1616.1A of 10 MAY 1983). Marks below 3.0 are most commonly associated with a disciplinary censure, such as nonjudicial punishment, relief for cause, a pending administrative dismissal, or a court martial. Therefore, anytime a performance mark of 3.0 or lower was encountered for a single reporting period, that period was coded as one instance of substandard performance.

Job Experience. Each duty assignment documented in the corpsman's service record was coded in two major respects -- the context in which the assignment occurred, and the type of duties performed. Assignment context was categorized as either ship, hospital, clinic, school, field, or "other." Types of duties were categorized as either clinical, administrative, teaching, equipment operator/lab duties, or "other." Only post-boot-camp active-duty assignments excluding duty under instruction were included. Assignments for duty under instruction ("DUINS") were included as a training variable. Although both the number of tours and duration of tours in months were coded, the number of tours was dropped because of the excessive degree of statistical dependency (i.e., the two types of information were highly redundant). The number of months was chosen because it demonstrated greater variance.

Coding job experience data according to context and type of duty required judgment calls in approximately 20% of instances. This was usually because the narrative remarks from early career performance evaluations were no longer in the service record. These earlier evaluations are routinely removed by the Naval Military Personnel Command in order to reduce record storage requirements. However, the information is summarized on the "Enlisted Performance Record" (Page 9) of the service record, in the form of five primary evaluation marks, date, reason for report, and name of command.

Ambiguities encountered in the coding of assignment contexts and duty types were systematically addressed by cross-checking information on the various types of records, especially the "Navy Occupational Training and Awards History" (Page 4), "Transfers and Receipts" (Page 12), and "Administrative Remarks" (Page 13). Other documents which provided concurrent situational clues were also taken into account. A coding scheme was developed to classify assignments for which no additional duty information other than context was available. This scheme was based on information suggested by senior corpsmen attached to NHRC, and is presented in Appendix B.

Qualitative Factors. Information of a qualitative nature was coded to explore possible failure-related factors that might not be adequately measured using quantitative variables alone. The primary sources of information were the performance evaluation narratives written by commanding officers during the shipboard tour in question. The remarks of inspection teams were also considered. These remarks are normally entered into the service record when a relief action is involved. Occasionally, written rebuttals by the corpsman appeared in the record, and these were taken into consideration insofar as such remarks might have helped to clarify the causal factor that led to job failure. These remarks were not used to determine whether or not the relief was justified.

In addition to recording the reason(s) for relief and any criticisms about the corpsman's administrative ability or medical judgment, the occurrence of any reference to overweight, marital, or prior health problems was noted.

Pre-Relief Job Performance Marks. In order to examine downward performance trends that might signal job failure, five primary performance factor marks were encoded from the period around the time of job failure. This time period included the time of performance-related relief (or the latest report for 1983 in the case of controls) and the three reports prior to that evaluation, excluding reports pertaining to duty under instruction. This span of time was considered most likely to indicate levels of performance causally related, in a temporal sense, to job failure. Marks assigned while in training status were excluded primarily because the Navy believes them to be unreliable from school-to-school (NAVMILPERSMAN JAN 1985).

The five performance factor marks were general performance, reliability, flexibility, leadership, and conduct. Differences in reporting formats for performance evaluations were taken into account to insure comparability regardless of form used during the time period.³ All marks were transformed into a 10-point metric descending from 4.0 used by the Naval Military Personnel Command (Robertson, Royle, and James 1973).

Analyses

Data analyses examined three distinct periods: Before entering IDT school, after entering IDT school, and after reporting for shipboard IDT duty. Data analyses were organized according to the four research objectives stated in the background section.

The first set of analyses examined the period after reporting for IDT duty. They were designed to meet the first study objective: To describe the prevalence and causes of job failure based on performance-related relief data obtained for 1982 and 1983. The second set of analyses examined the period prior to entering IDT school in order to identify possible screening criteria derived from background factors significantly related to IDT job failures (Objective II). The third set of analyses examined the period after entering IDT school. These analyses tried to determine whether a change either training standards or assignment criteria might be warranted on the basis of a relationship between class standing in IDT school and job failure (Objective III). Finally, the fourth set of analyses also examined the period subsequent to reporting for shipboard duty. It consisted of an examination of performance trends leading up to job failure in order to determine if early intervention might be possible (Objective IV).

Objective I: Prevalence and Causes of Job Failure. The prevalence of job failures among Fleet IDT corpsmen was estimated by tabulating personnel transfer data for IDTs during a two-year period ending in 1983. These data were provided by the Enlisted Personnel Manpower Analysis Center, New Orleans. The number of job failure cases was divided by 389, the approximate number of shipboard IDT billets in the 1982-1983 time frame as published in the annual Force Summary of the Naval Review.⁴

Analysis of the causes for IDT job failure began with a classification of the reasons stipulated in the narrative remarks in the service record. These remarks were most often in the periodic performance evaluations. Narrative descriptions were summarized and sorted using a conceptual clustering strategy (Q-sort; Gough & Woodworth, 1960; Block, 1961) in order to identify categories of causal factors.

Objective II: Screening Criteria. Identification of potential screening criteria consisted of a 1-way multivariate analysis of variance (MANOVA) to test overall multivariate differences between the effective and job-failure corpsmen on four categories of **pre-selection** background variables: (a) contexts of prior assignments (e.g., ship, clinic, etc.), (b) types of duty (e.g., administrative, clinical, etc.) during prior assignments, (c) performance history (e.g., negative evaluations, awards, etc.), and (d) job training (i.e., total HM training, and number of "C" schools attended). This procedure established whether significant reduction in the number of job failures might be possible through improved applicant screening. Post-hoc tests consisted of four discrete MDAs, computed for each pre-selection background category (Spector, 1977).

Finally, in searching for potential screening variables, researchers normally strive to identify factors that not only significantly distinguish between successful and unsuccessful applicants, but that account for a substantial amount of of between-group variance (Barker & Barker, 1984). However, in the present case, a great deal of between-group variance has already been exhausted through a) current selection procedures already in use, as well as b) career attrition caused by selective promotion. Therefore, any significant between-group variance discovered in this study, even though small, would be likely to improve screening of IDT training applicants.

Objective III: Training and Assignment Criteria. Evidence of a significant relationship between job failure and classroom achievement would justify consideration of using class standing as a qualification or an assignment criterion. However, because there are costs associated with both screening and assignment, the amount of predictive variance unique to class standing will be examined through use of MDA.

If a significant increment in job failure prediction could be accomplished over and above the prediction provided by improvements in pre-training screening, it would suggest that enhancement of IDT effectiveness could best be accomplished by both the expansion of screening criteria, as well as basing assignment decisions on demonstrated mastery of IDT skills and knowledge during training.

Objective IV: Performance Trends. Three performance evaluations leading up to the time of job failure were analyzed in order to determine whether the causal process resulting in job failure involved progressive performance deterioration over many months or occurred in a relatively brief span of time.

Multivariate discriminant analysis (MDA) was used to contrast the effective and job-failure groups, and to examine, as predictor variables, average performance marks assigned for the three

successive periods prior to job failure. Performance marks assigned at the time of job failure were excluded because, at that point, the prediction question is moot. It would be expected that performance marks assigned to effective corpsmen would show no significant change across the three targeted periods. Therefore, with respect to ineffective corpsmen, a significant multivariate solution that exhibited a trend of increasing weights over time (3-prior to 2-prior to 1-prior) would reflect a progressive process of performance deterioration. If the univariate mean score differences also were shown to be significant 1 or even 2 evaluations prior to relief, this would imply that potential job failures could be identified perhaps 12 or more months before the initiation of a personnel action to relieve from duty.

Finally, in order to determine which specific aspect of IDT job performance was most strongly associated with actual job failure, the five discrete grades at the time of relief from duty were also subjected to discriminant analysis.

RESULTS

Objective 1: Prevalence and Causes of Job Failure

Prevalence of IDT Job Failure. Given the operational definition of job failure as a performance-related relief which could be verified in the service record, a conservative estimate of the occurrence of job failure in the Fleet based on reliefs during 1982 and 1983 was about **5% per year**, most of these (69%) occurred during the first year of duty. This was based on a ratio of an average 18.5 failures per year to approximately 389 Fleet billets⁴ covering the period 1982 and 1983. The 37 failures were nearly equally distributed over the two year time frame (Appendix C).

It might be speculated that a 5% annual failure rate is too conservative in that some IDT corpsmen possibly avoided job failure by seeking early relief for medical conditions, humanitarian reasons, or non-reenlistment. Therefore, a more liberal estimate was derived from data provided by the Enlisted Personnel Manpower Analysis Center on all shipboard IDT unprogrammed reliefs during the target period.

Excluding administrative transfers due to outstanding performance (e.g., selection for warrant officer training), there were 17 medical transfers (including 5 transfers for alcohol rehabilitation excluded from the current study because no performance decrement was mentioned in their service records), 5 humanitarian transfers, and 10 failures to re-enlist. If the assumption was made that as many as half of these were motivated by fear of job failure, then a liberal estimate of the number of IDT corpsmen experiencing significant performance problems might approach **7% annually**.

Causes For Failure. Table 4 presents the descriptive breakdown of recorded reasons why IDT corpsmen underwent performance-related reliefs. Three major categories of reasons were summarized, each of nearly equal likelihood: (a) inspection failure, (b) disciplinary infraction, and (c) difficulties in getting along with the superiors.

Table 4

Categorized Reasons for Job Failure Among Shipboard Independent Duty Corpsmen
Sampled for 1982 and 1983

	Category % (N)	Reason % (N)	SURFPAC (N)	SUBPAC (N)	SURFLANT (N)	SUBLANT (N)
INSPECTION FAILURE	38% (14)		(7)	(1)	(5)	(1)
Force Medical Readiness Insp.		27% (10)	(5)	(1)	(3)	(1)
INSURV Inspection Failure		8% (3)	(1)	(0)	(2)	(0)
REFTRA Failure		3% (1)	(1)	(0)	(0)	(0)
DISCIPLINARY INFRACTION	32% (12)		(6)	(2)	(3)	(1)
Substance Abuse-Related		19% (7)	(4)	(1)	(2)	(0)
Criminal Behavior		13% (5)	(2)	(1)	(1)	(1)
PROBLEMS DEALING WITH SUPERIORS	30% (11)		(5)	(2)	(2)	(2)
Loss of Command Confidence		16% (6)	(1)	(1)	(2)	(2)
Inability to deal with CO/XO		14% (5)	(4)	(1)	(0)	(0)
	<hr/>		<hr/>	<hr/>	<hr/>	<hr/>
	100% (37)		18	5	10	4

Inspection failure accounted for the highest proportion of job failures. Disciplinary infractions comprised the second most-common factor leading to relief. More than half the disciplinary infractions were substance abuse related. This included not only personal drug and/or alcohol abuse, but also serious irregularities in accounting for controlled substances that might or might not have involved drug use by the corpsman in question. A second irregularity involved falsification of urine screening on behalf of fellow crewmen. Criminal behavior included acts such as check forgery and disturbing the peace.

Lastly, a slightly smaller, but still considerable, percentage of corpsmen experienced an inability to deal effectively with their COs and/or XO's. These IDTs became involved in conflicts with their superiors, and their inflexibility resulted in actions to have them removed. In nearly half of these cases, Force medical inspection team visits were requested by the command, and these inspections often uncovered deficiencies. However, these cases were coded as "problems with superiors" because, in comparison with descriptions of cases coded as being precipitated by routine inspection, it was apparent that the command called the inspection primarily due to erosion of command confidence or as a disciplinary measure.

Objective II: Screening Criteria

Demographics. It is unlikely that background characteristics of a demographic nature should be related to job effectiveness among a group as homogeneous as IDT corpsmen. As the sample descriptions in Tables 1 and 2 indicated, only one demographic characteristic showed evidence of a significant between-group difference. Effective and job-failure IDT corpsmen did not differ in age, race, marital status, amount or source of Navy Medical training, aptitude, or time as a corpsman (mean time for both groups was 14 years; $F(1) = 2.30, [ns]$). They did, however, differ in that **job failures tended to be more junior in rank at time of reporting for IDT duty aboard ship during the target period.**

Although rank was significantly associated with job failure, screening applicants on the basis of rank would appear to be impractical. The distribution of rank among IDTs was shown by Nice (1984) to be approximately 50% first-class petty officers (E-6) and 50% chief petty officers (E-7). The 50/50 distribution of rank was further supported by the rank distribution of the control sample

for this study. Both results implied that a large percentage of E-6 personnel are currently required in order to fill existing billet requirements. Consequently, it would seem more appropriate to consider rank in the context of the assignment process rather than to use it as a selection variable for screening applicants.

Career Background. A series of analyses addressed identification of "pre-selection" career background variables that might significantly improve personnel screening. Results of these analyses indicated that when examining job experience, amount of job training, and performance history, **only performance history was significantly related to job effectiveness.**

The first stage of the analyses involved an overall test of multivariate between-group significance using a 1-way multivariate analysis of variance (MANOVA) of all the predictor variables considered. A significant MANOVA solution was established using Hotelling's T^2 test: $T^2=0.38$, $-F_{mul.}(16,79) = 1.38$; $p<.04$. This result justified more focused analyses to identify the specific variables which most accounted for between-group differences. As suggested by Spector (1977), follow-up results were based on post-hoc MDAs examining separately job experience (duty context, duty type), job training, and performance history.

Job Experience. Table 5 presents results of the separate MDAs run on the two categories of job experience. Type and context of duty each failed to reach multivariate significance in distinguishing between groups.

Table 5

Discriminant Analyses of Pre-IDT-School Differences Between Job Failures and Effective (Controls) Independent Duty Corpsmen Based on Type and Context of Prior Duty Assignments

Pre-IDT School					
Type of Duty	Controls Mean Mos.	Discr. Wts	Job Failures Mean Mos.	1-Way F-Test	Sig.
Clinical Care	24.7	.37	28.0	.7	[ns]
Administrative	40.7	-.06	39.8	.0	[ns]
Lab/Tech	5.4	-.66	8.6	1.0	[ns]
Teaching	3.7	.40	1.3	1.9	[ns]
Eigenvalue = .05, $R_c=.22$, $X^2(4,N=83) = 4.74$ $p<.32$ [ns]					
Context of Duty					
Hospital	27.9	-.14	26.2	.0	[ns]
Clinic	4.3	.42	6.5	.7	[ns]
Shipboard ^a	13.9	.19	15.9	.5	[ns]
Field (Marine)	5.9	.83	10.9	5.1	$p<.02$
School Staff	3.0	-.14	2.3	1.9	[ns]
Eigenvalue = .06, $R_c=.25$, $X^2(5,N=93) = 5.77$ $p<.33$ [ns]					

^a Includes all ship's company experience and underway experience with Marine division aboard amphibious assault ships.

Training & Performance History. Table 6 presents the separate MDAs on pre-IDT school training exposure and performance history. Simultaneous entry of variables was employed. Although training and awards failed to reach multivariate significance, number of substandard evaluations significantly distinguished between effective and job-failure IDTs, accounting for 7% of between-group variance. The distribution across force and fleet of the number of substandard evaluations is displayed in Appendix D.

Table 6

Discriminant Analyses of Pre-IDT-School Differences Between Job Failures and Effective (Controls) Independent Duty Corpsmen Based on Training and Performance History

Pre-IDT School					
Training	Controls Mean	Discr. Wts	Job Failures Mean	1-Way F-Test	Sig.
Number "C" Schools	1.1	.61	0.9	0.7	[ns]
Months HM Training	8.1	.14	8.7	0.3	[ns]
Eigenvalue = .02, $R_C = .15$, $X^2(3, N=95) = 2.23$ $p < .33$ [ns]					
Performance History					
Number Sub-Standard Evals ^a	1.4	.80	2.2	14.4	$p < .000$
Number of Awards	9.7	-.41	7.9	3.8	[ns]
Number of NJPs	0.3	.29	0.6	1.9	[ns]
Eigenvalue = .08, $R_C = .27$, $Eta^2 = .07$, $X^2(3, N=95) = 7.16$ $p < .05$					

^a Number of evaluations with one or more grades of 3.0 or less.

The question remains as to whether or not discriminant validity accounting for only 7% of between group differences is sufficiently high to justify expansion of IDT corpsman applicant screening criteria. Schmidt, Hunter, McKenzie and Muldrow (1979) underscored the practical utility of a very small increment in prediction in accounting for substantial improvements in personnel decision-making. Using tables developed by Taylor and Russell (1939), it was possible to estimate the practical improvement in job effectiveness screening represented by a multivariate Eta^2 of .07. Entry into the tables required both an estimation of the Navy's current selection ratio for shipboard duty (about 50%, as mentioned earlier), and the current job failure rate for shipboard IDTs (between 5 and 7%).

Based on the Taylor and Russell tables, the estimated improvement derived from screening applicants on instances of substandard performance could potentially reduce the 7% estimated failure rate to 4.5%: A 39% reduction in job failure from 28 to 17 per year. In the case of the 5% estimated failure rate, this means a drop to 3%, which represents about a 40% reduction in job

failures from 18.5 to 11.1 job failures per year. These results, therefore, support expansion of current screening criteria to reduce the number of fleet IDT job failures.

Objective III: Training and Assignment Criteria

A simple cross-tabulation of class standing determined that 79% of job failures were in the bottom half of their class; 52% in the bottom quarter. The correlation between job failure and class quarter at time of graduation from IDT training was found to be $r=.24$, which was significant at the .01 level. This result suggested that, in addition to significant prediction of job failure by incidences of substandard performance prior to selection for IDT training, job failure might also be predicted on the basis of classroom achievement.

The question remains, however, whether applicant screening, assignment based on academic performance, or both warrant consideration as possible strategies to reduce the incidence of job failure. One way of determining the answer to that question was to see if class standing could substantially increase prediction of job failure beyond that possible by instances of substandard job performance. The two nonsignificant performance history variables, NJPs and awards were dropped due to nonsignificance, and class standing was added after instances of substandard performance.

Table 7 provides information on whether class standing (the assignment variable candidate) added substantively to between-group prediction over and above prediction by instances of substandard performance (the screening variable candidate). Results indicated that, when comparing the equation without class standing (MDA Step I) to that containing class standing (MDA Step II), the addition of class standing improved prediction significantly ($p<.01$). This also raised the Eta^2 to .10, indicating an increase in between group prediction from 7% (using substandard performance alone) to 10%.

Table 7

Discriminant Analyses of Pre- and Post-IDT-School Differences Between Job Failures and Effective (Controls) Independent Duty Corpsmen, Forcing Class Standing Ahead of Substandard Performance

Select Variables	Controls Mean	Discr. Job Failures Weights Mean	1-Way F-Test	Sig.	Wilks' Lambda After Entry	Sig. of Increase
Pre & Post-IDT School						
Number Sub-Standard Evals ^a	1.2	.80	2.2	6.0	$p<.02$.9322 (Step 1) -NA-
IDT Class Standing (Class Qtr) ^b	3.1	.74	2.6	5.2	$p<.03$.8985 (Step 2) $p<.01$

$$\text{Eigenvalue} = .11, R_c = .32, \text{Eta}^2 = .10, \chi^2(2, N=85) = 8.8 \quad p<.01$$

^a Number of evaluations with one or more grades less than 3.2.

^b Fourth quarter is the highest; first quarter is lowest.

In order to determine the degree of independent predictive variance possessed by class standing alone, a second MDA was run reversing the order of variable entry. Independently, class standing accounted for 6% of between-group variance (indicated by a Wilks' Lambda of .9412). This was both

statistically significant ($p < .03$), substantively meaningful. The decrease in Wilks' Lambda at Step II was almost identical: .04 when adding substandard performance second, versus .03 when entering it first. This suggested that the degree of overlap in total predictive variance for both substandard performance and class quarter was substantial. Each variable independently predicts group differences to the same degree, and to the same extent, each adds significant prediction when combined with the other.

Finally, although the Eta^2 increased significantly to .10, when assignment based on class quarter was added as a predictor (Table 7), it was still necessary to determine if the estimated practical improvement in screening using both variables improved substantially. Using the Taylor and Russell tables, the estimated percent of improvement in screening out potential job failures signified by an Eta^2 of .10 remained unchanged at 39% for the 7% failure rate, and 40% for the more conservative 5% failure rate.

This result seems to provoke a dilemma. On one hand, addition of a second predictor (either substandard performance - screening, or class standing - assignment) significantly improved between-group prediction, yet on the other hand, this improvement was insufficient to permit an estimable improvement in screening job failures. At first blush, such a result would seem to demonstrate an almost equal "practical" ability to reduce the incidence of job failure in the fleet. However, this result may merely indicate a type of ceiling effect. Because the remaining percentage of failures left unexplained by either substandard performance or class standing stands at only 3%, it is possible that even a significant increment in between-group prediction of 3 to 4% using both variables simply cannot be estimated when the rate of job failure approaches zero. Consequently, in a practical sense, it might prove to be of utility to incorporate both strategies using both variables.

Objective IV: Performance Trends

Table 8 presents the results of an MDA run on the mean performance marks given for the three periods prior to a performance-related relief or, in the case of controls, the three evaluation periods prior to their due-course relief or November 1983, whichever was later. Inspection of the multivariate discriminant weights presented in Table 8 indicates that, relative to controls, there was a significant, monotonic, downward trend in performance among job-failure IDT corpsmen. This trend was evidenced by the smallest between-group difference occurring at three reports prior to relief, and the greatest difference one report prior to relief. These results established the existence of a progressive deterioration of performance preceding a job failure.

The three mean performance measures were entered into a multivariate discriminant analysis, both hierarchically according to time and simultaneously. The results using either procedure were the same. It is noteworthy that even three reports prior to relief, representing a median period of 2.3 years, there was a significant univariate performance mark difference between the groups. Consequently, it would appear that significant performance decrements do occur well prior to a performance-related relief.

Table 8 also presents a follow-up MDA on the performance marks given at time of performance-related relief (due course, or last 1983 evaluation, for controls). Because "performance" is an overview evaluation mark, it certainly will be related to more discrete ratings. Theoretically,

Table 8

A Multivariate Comparison of the Mean Performance Marks for Job Failures and Effective (Controls) IDT Corpsmen
Sampled for 1982 and 1983

Discriminant Analysis

Mean Overall Performance Prior to Relief^a

	<u>Job Failures</u>	<u>Wts</u>	<u>Controls</u>	<u>One-way F-Tests</u>
1 Report Prior	3.58	.96	3.91	F(94) = 30.44, $p < .000$
2 Reports Prior	3.74	.57	3.89	F(95) = 10.60, $p < .002$
3 Reports Prior	3.76	.53	3.88	F(95) = 9.14, $p < .003$

Canonical R = .51, $\text{Eta}^2 = .26$, $\chi^2 (3, N=95) = 27.8$, $p < .0000$

Overall Percentage of Cases Correctly Classified = 77%

Discriminant Analysis

Mean Performance Ratings At Time of Relief

	<u>Job Failures</u>	<u>Wts</u>	<u>Controls</u>	<u>One-way F-Tests</u>
Performance	2.51	.90	3.91	F(95) = 123.0, $p < .000$
Reliability	2.40	.88	3.87	F(95) = 117.5, $p < .000$
Flexibility	2.78	.84	3.90	F(95) = 107.6, $p < .000$
Leadership	2.90	.63	3.87	F(95) = 61.3, $p < .000$
Conduct	3.21	.45	3.96	F(95) = 31.3, $p < .000$

Canonical R = .81, $\text{Eta}^2 = .66$, $\chi^2 (3, N=95) = 82.8$, $p < .0000$

Overall Percentage of Cases Correctly Classified = 95%

Correlation between Performance & Reliability $r = .90$

^a The average derived from three evaluations prior to performance-related relief as IDT, or for controls, three evaluations prior to their last marks for 1983.

the discrete performance marks additively comprise overall performance. Nevertheless, performance was kept in the equation in order to control for its "halo effect" in affecting the other marks. Consequently, in this analysis, it is not the size of the mean scores that are of interest, but the size of the weights (overlooking the one for performance). **Both reliability and flexibility were shown to be the most important performance factors for distinguishing between the effective and job-failure corpsman groups.**

The analysis of performance at the time of relief was conducted to determine in which area(s) corpsmen were viewed as being most deficient. Although this analysis failed to identify a convenient single area in which corpsmen were most deficient, it did demonstrate that leadership and conduct were viewed by commanding officers as less related to corpsman effectiveness than were reliability and flexibility.

DISCUSSION OF RESULTS

Objective 1: Prevalence and Causes of Job Failure

Prevalence of IDT Job Failure. The derivation of an accurate estimate of the prevalence of job failure among shipboard IDT corpsmen was not straightforward. Definitional problems complicated identification of job failures. Even settling on a population comprised of performance-related reliefs led to other case identification problems. The identification of personnel who had been formally relieved for cause, required a case by case search through the files at the Enlisted Quality Control Review Board, and these files only went back about 20 months. Invariably, each command and force providing identification of possible performance-related reliefs had to base their nominations on recollections, and informal lists or collections of lists. Consequently, the prevalence of job failure among shipboard IDT corpsmen still remains a "rough estimate" between 5 and 7%.

The seriousness of a 5 to 7% annual failure rate warrants comment. A "ball park" estimate of turnover is provided by the Bureau of National Affairs (1980). The Bureau estimated annual turnover in the health care professions generally to be about 25%. Across all industries, the Bureau estimated an average annual turnover rate of 24%. Such turnover rates are not uncommon in the organizational behavior research literature. However, these rates only include people who leave the organization (as opposed to leaving only their job), people who leave voluntarily as well as involuntarily, and new hires as well as those with considerable organizational tenure. Consequently, determination of an accurate nationwide estimate to compare to the mid-career, blue collar, IDT corpsman job failure population is not possible.

Actual determination of seriousness is dependent on associated costs with respect to financial losses, morale, and health risks. Financial costs include primarily the expense of providing a trained replacement for each job failure. Morale costs relate mainly to the negative impact on the image of Fleet medical care, as well as the negative impact on morale among the crews involved. Finally, health risks include both increased possibility of administrative oversights such as late physicals or missed immunizations, as well as more immediate risks arising from poor clinical judgment or improper treatment. Each of these costs must be weighed relative to options available to reduce the incidence of job failure.

Finally, it must be recalled that the prevalence of job failure reported in this study was determined on the basis of nonclinical criteria. That is, performance had deteriorated to a point requiring relief by the commanding officer. Commanding officers are only equipped to evaluate administrative and military knowledge, judgment, and performance unless confronted with a obvious case of malpractice. Most shipboard medical department inspections do not address clinical knowledge, judgment or ability. Even Force Medical Department inspections, which are likely to occur only once or twice during the tour of a typical IDT corpsman, have tended to emphasize clerical matters such as record-keeping, supplies, and periodic medical reports. Without further study, it is not possible to determine the extent to which administrative incompetence relates to clinical incompetence.

Causes of Job Failure. The present data cannot determine with certainty the extent to which lack of fleet, force, shore, and/or command support contributed to job failure, nor the extent to which a lack of managerial ability, task knowledge, or maturity led to any specific instance of corpsman ineffectiveness. Nevertheless, this report does present data that sheds additional light on the causal role of several major factors: (a) command support, (b) demographic background and (c) maturity.

The causal role of command support is unclear, although it appears to be a critical factor related to corpsman effectiveness. The current data cannot indicate whether lack of command support caused corpsman job failure, or deficiencies in the corpsman led ultimately to lost command support. The data reported in Table 4 showed, however, that a loss of command confidence directly or indirectly accounted for 16% of job failures. However, because the causal relationship was indeterminate, it is only possible to conclude that **command confidence appears to be related to job effectiveness.**

With respect to demographic background, including both aptitude and age, the data in Table 1 also reflect little difference between effective and ineffective corpsmen. However, a significant difference was found for rank at time of reporting aboard ship for IDT duty. E-6 (First-Class Petty Officers) corpsmen were more likely to undergo job failures than were E-7s (Chief Petty Officers). Because there were no differences between time-in-grade and years of service between E-6s and E-7s, it would appear that E-6 job failures had careers that were progressing at a slower pace than their E-7 counterparts.

An additional factor that should be considered is that most reliefs occurred among first-tour IDTs. It is possible that Chief Petty Officers experience more cooperation and/or Command support than do First-Class Petty Officers, and support is often most critical when trying to learn a new job. Although limiting IDT assignments to E-7s is not likely to be practical, it would seem to make sense to assign more-senior personnel to difficult assignments (such as to relieve unsuccessful IDTs, or to serve with larger crews).

Finally, immaturity seems to have been a possible causal factor in some cases. The data in Table 8 reflected that many ineffective corpsmen were rated by their commands as being inflexible and unreliable. Both inflexibility and unreliability are traits associated with immaturity. In addition, disciplinary problems represented 32% of job failures, and ineffectiveness in dealing with superiors accounted for another 30%. For a mid-career petty officer to engage in substance abuse or criminal activity reflects, among other things, immaturity. Likewise, ineffectiveness in dealing with superiors, in some cases, can likely be traced to immaturity.

Objective II: Screening Criteria

Training. With respect to training background, data presented in Table 1 and Appendix A indicated that effective and ineffective corpsmen did not differ significantly with respect to the number of "C" schools attended, the total number of months spent in corpsman training, nor the levels of educational achievement. Therefore, with respect to job training, all things, at the time of applying for IDT training, seem to be equal.

Job Experience and Performance History. The analyses presented in Tables 1 and 5 indicated that effective and ineffective corpsmen did not differ in amount of job experience, types of duty assignments, or the contexts in which that duty occurred. However, the analyses presented on Tables 5 and 6 indicated that **consistent quality of performance** (i.e., instances of substandard performance across one's career), **not the type of task or the context of that performance, was what differentiated effective IDT corpsmen from job failures.**

With respect to performance history, the quality of a corpsman's past performance prior to selection for school has been demonstrated in this study to predict job failure. Therefore, institution of expanded applicant screening seems warranted. Current Navy personnel selection policy limits examination of IDT applicant performance history to only the most recent three year period. The results of this study would seem to support expansion of personnel selection criteria to cover the entire period of an applicant's career, and exclusion of applicants with several instances (3 or more) of substandard performance (marks of 3.0 or lower).

In addition to expansion of selection standards, a more rigorous applicant review process might potentially extend screening accuracy beyond estimates reported here by taking into consideration not only performance history, but also impressions of maturity and other traits required in an operational shipboard environment. An applicant review board similar to that currently used in selection of officer candidates could be restructured to include several medical representatives in addition to operational line representatives. Another possible solution might be to develop and institute a battery of selection tests designed to screen applicants on job-relevant attributes.

Objective III: Training and Assignment Criteria

Class Standing. The relationship found in this study between job failure and class quarter would seem to suggest that, **the effectiveness issue is not one of training content, but of training criteria.** The training criteria problem can be dealt with in at least two ways. The first method consists of placing greater responsibility on training commands to raise standards through holding IDT trainees to a higher standard of demonstrable skill mastery. A second option, would be to assign only top trainees to shipboard duty upon graduation.

Current IDT trainee assignment policy is based solely on sea-shore tour rotation cycles. The Naval Personnel system requires a lead time of six or more months to execute shipboard assignments. This requires issuance of orders without regard to trainee performance. Moreover, adherence to a standard sea-shore rotation cycle results in about 50% of non-submarine force IDT graduates (NEC-8425) being assigned to shore duty versus the sea duty for which they have just been trained. Consequently, delay of assignment until near completion of training and/or assigning all successful IDT trainees to sea would require reorganization of some personnel procedures.

One caveat must be raised. The amount of prediction of job failure demonstrated by class quarter was nearly the same as that for substandard performance history (c. 40%). This raises the question as to whether it would be better to screen applicants on the basis of prior performance or to screen graduates by basing assignments on classroom achievement.

Selection Versus Assignment. Results established that both pre-training selection, based on total career substandard performance evaluations, and post-training assignment, based on IDT training achievement, showed a nearly equal potential capability of reducing the incidence of IDT job failure. This fact raises the question of whether one or the other, or both methods should be considered for implementation.

It is true that in a statistical sense, IDT class quarter was shown to add significantly to the prediction of job failure. However, the additional 3% increase in prediction over and above that already predictable by substandard performance was estimated to be insufficient to screen out additional job failures. This is because it takes a considerable increase in between-group predictive power to achieve substantial improvements in screening job failures as the percentage of those failures approaches zero.

The least costly approach would be to screen applicants by excluding corpsmen who lack a history of consistent quality performance. Such an approach would save the expense associated with a permanent change of station, as well as training costs. There is, however, an additional relevant consideration. Historically, the staffing needs of the Navy have required occasional waivers of selection or assignment standards in order to respond to unforeseen contingencies. Because the additional cost of implementing both strategies examined here is relatively moderate, modification of both selection and assignment procedures would help to maintain actual reductions in job failure at approximately the 40% level estimated by the results of this report.

Table 9 presents an actual breakdown of the subjects in this study by both criteria variables. Table 9 demonstrates that by screening out applicants with 3 or more instances of substandard performance, 32% of the job failure sample would have been excluded. Moreover, the cost associated with this modification of assignment policy is likely to be modest. This is to be contrasted with the effects of assigning to shipboard duty only those who graduated in the top three quarters of their class. With this strategy, 55% of job failures would have been excluded, however 28% of controls (non job-failures) would also have been excluded.

Objective IV: Performance Trends

One major source of Force Medical support is the medical readiness inspection. Failure of Force Medical readiness administrative inspections accounted for 28% of job failures and 70% of all the inspection failures that resulted in relief from duty. Each Force provides technical assistance to corpsmen when it is requested. Interviews with the Force Medical Master Chiefs conducted during 1984 indicated that requests for assistance due to inspection failures frequently uncovered problems that had evolved to such a point that job failure could not be prevented. This raises the question of why corpsmen fail to initiate requests for help early enough to avoid job failure.

Table 9

Tabular Summary of Substandard Performance and IDT Training Class Quarter
Broken Down by Job Failures and Effective (Controls) Corpsman^a

	Substandard Performance ^b		IDT Class Standing			
	<u>Job Failures</u>	<u>Controls</u>	<u>1st Qtr</u>	<u>Job Failures</u>	<u>Controls</u>	
None	27%	52%	15%	26%		
1	27%	22%	6%	18%		
2	14%	12%	27%	28%		
3	. >> 14%	. >> 5%	52%	28%		
4	. 6%	. 3%				
5	. 8%	. 2%				
6	. 32%	. 14%				
7	. 2%	. 2%				
8				
9	. >> 2%	. >> .				

^a Dashed lines and bold figures indicate point of maximal screening and minimal error.

^b Number of evaluations with one or more grades less than 3.2.

Corpsmen who fail to request technical assistance from Force Medical Departments, when it is required, may be insensitive to their own deteriorating performance, or perhaps they are too proud to seek help. Sensitivity to one's own performance can be improved through increased monitoring and feedback. However, the pride issue relates to immaturity, which is unlikely to change as a result of on-the-job intervention. Table 8 demonstrated that it is possible to identify deterioration in performance prior to job failure based on the Navy's annual enlisted performance evaluation. Therefore, if internal monitoring by corpsmen is insufficient to detect that the job is becoming unmanageable, for whatever reason, it might be useful to increase the amount of external monitoring (supervision) of corpsman effectiveness.

Performance-Related Relief: Post Script

The present study has served to identify certain shortcomings in the way the Navy screens and assigns independent duty corpsmen based on a study of job failures. One question left unanswered concerns what became of these corpsmen. Personnel files were consulted as of March 1985, to determine the disposition of each of the 37 job failures studied. Three corpsmen had retired, 5 more did not re-enlist, 20 had their NECs converted (2 to 0000, 1 to 8294, 2 to 8407, and 15 to 8404) and were re-assigned shore duty, whereas 9 (24%) retained their independent duty NEC.

Of the nine corpsmen who retained their IDT NEC, 1 was reassigned to independent duty aboard a destroyer, 1 was assigned to an aircraft carrier, 2 were assigned to Marine units, 3 were assigned to hospitals or clinics, 1 was sent to a reserve center, and 1 was serving with a Naval Air Detachment. Of those whose NECs were changed, 1 was assigned to a submarine tender (8407), 10 were assigned to Marine units, 3 went to hospitals or clinics, 5 went to reserve centers, and one went to the military sea-lift command ashore.

One conclusion that could be made on the basis of these post-relief data is that **IDT job failure does not necessarily infer Navy job failure**. In almost 80% of the cases, the corpsmen continued in the Naval service, albeit in a less responsible capacity. However, the question remains as to what percentage of the 9 corpsmen whose IDT NECs were not removed should have lost their IDT NECs except for lack of administrative follow-up. Furthermore, it is unclear what safeguards exist that would preclude reassignment of an IDT job failure to shipboard independent duty.

Conclusions

Considering the causes of job failure described in this report, it would seem cost effective both to expand applicant screening to include performance history and to modify current shipboard IDT assignment procedures to take academic achievement into consideration.

The usefulness of increased medical supervision among Fleet units also seems justified in view of the results reported in this paper. Increased supervision might even help alleviate some of the pressure experienced by successful IDTs by increasing the frequency of administrative feedback on medical readiness. Increased supervision would also help detect deteriorating performance, increase access to a broader base of medical skill and knowledge, and it might permit implementation of a formalized qualification and recertification program. The cost of increased supervision in terms of additional personnel at either the squadron or force level would likely be substantial. The potential benefits, in terms of increased quality of health service delivery Fleet-wide could be substantial as well.

Footnotes

¹Information was based on interviews conducted on three occasions during visits to NMPC during 1984.

²In March of 1984, a list of duty assignments for all graduates of the Advanced Hospital Corps School in San Diego was provided by HMCS Keen, USN, Acting Director of Advanced Hospital Corps School. The period covered 18 months ending in January 1984. It reflected that slightly over 50% of graduates were ordered to shore duty assignments.

³The five factors listed below are commonly used by Navy Military Personnel Command as a basis for making personnel decisions:

<u>Factor:</u>	<u>Evaluation Form Box Numbers</u>		
	NAVPERS	NAVPERS	NAVPERS
	<u>(792)</u>	<u>(1616/8)</u>	<u>(1616/ser)</u>
1. Conduct/Behavior	08	18	32
2. Leadership/Directing	03	21	36
3. Reliability	07	16	30
4. Flexibility/Potential	06	20	29
5. General Performance	17	13	39

⁴Based on a figure derived from the reported Naval Force strength published in the Proceedings of the Naval Institute Annual Review for 1983 and 1984.

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Appendix A

Breakdown by Group of the Means and Standard Deviations for the Major

IDT-Corpsman Background Variables

Variables	Job Failures		Controls		T-test	Sig.
	Mean	S.D.	Mean	S.D.		
DEMOGRAPHICS:						
Age	35.7	3.5	35.6	3.2		[ns]
Times Married	1.1	0.7	1.3	0.7		[ns]
Number of Dependents	2.3	1.5	2.2	1.4		[ns]
Aptitude	117.0	10.4	117.8	11.8		[ns]
Year Became Corpsman	'69	3.9	'69	3.3		[ns]
EDUCATION AND TRAINING:						
High School Graduate	all		all			
Years Since "A" School	13.1	3.9	14.2	3.3		[ns]
Number of Pre-IDT "C" Schools	1.0	0.8	1.1	0.8		[ns]
Total Months Pre-IDT HM Training	8.7	6.8	8.1	4.5		[ns]
Year Graduated IDT School	1978	3.1	1977	3.1		[ns]
JOB EXPERIENCE:						
<u>Context of Duty :</u>						
Ship (# of months)	15.9	18.4	13.9	20.6		[ns]
Hospital (# of months)	26.2	22.0	27.9	24.1		[ns]
Clinic (# of months)	6.5	10.9	4.3	9.3		[ns]
School Staff (# of months)	2.3	9.9	3.0	9.8		[ns]
Field Medical (# of months)	10.9	14.5	5.9	9.3		[ns]
<u>Type of Duties:</u>						
Clinical (# of months)	28.0	13.3	24.7	22.5		[ns]
Administrative (# of months)	39.9	28.3	40.7	30.3		[ns]
Teaching (# of months)	1.3	4.3	3.7	9.6		[ns]
Lab/Tech (# of months)	8.6	20.8	5.4	14.9		[ns]
Misc (# of months)	3.7	9.7	5.7	11.3		[ns]
PERFORMANCE:						
<u>Mean Marks of 3 Pre-Relief Reports:</u>						
Conduct	3.88	0.2	3.95	0.1		[ns]
Leadership	3.67	0.3	3.87	0.1	4.90	p<.00
Reliability	3.64	0.3	3.86	0.2	4.36	p<.00
Flexibility	3.67	0.3	3.91	0.1	5.79	p<.00
General Performance	3.66	0.3	3.88	0.2	5.41	p<.00
Number of Non-IDT-Tour NJPs	0.6	1.0	0.3	0.9		[ns]
Number of Unauthorized Absences	0.3	0.8	0.1	0.4		[ns]
Number of Days Total Unauthorized Absence	1.1	5.1	0.1	0.3		[ns]
MISCELLANEOUS:						
Overweight Mentioned	N 2		N 9			
Marital Problems Mentioned	0		0			
Prior Health Problem(s) Mentioned	0		3			
Interservice Transfer	4		1			

Appendix B

Coding Scheme For Classification Of Unspecified Type of Duty

<u>CONTEXT</u>	<u>SITUATION</u>	<u>DUTY TYPE CLASSIFICATION</u>
Hospital:	Any	Clinical
Clinic:	Any	Administrative
School:	Non-Student	Administrative
Field:	Vietnam	Clinical
	Marine Air Wing	"Other"
	Otherwise	1/2 Clinical & 1/2 Admin.
Ship:	Hospital Ship	Clinical
	Independent Duty	1/2 Clinical & 1/2 Admin.
	Other Class Vessel	Administrative
	Out-of-Rating	"Other"
Other:	Out-of-Rating	"Other"
	Otherwise	Administrative

Appendix C

Breakdown of the Number of Reliefs by Force and Fleet

	<u>Year 1</u>		<u>Year 2</u>		
	<u>PAC</u>	<u>LANT</u>	<u>PAC</u>	<u>LANT</u>	
SURF	6	6	12	4	28
SUB	2	3	3	1	9
	8	9	15	5	37

Accession For	
NTIS CRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and/or Special
A-1	



Appendix D

Number of Job Failure Pre-IDT School Substandard Evaluations

Broken Down By Force and Fleet

<u># of Sub- standard Evaluations</u>	<u>SURFPAC</u>	<u>SUBPAC</u>	<u>SURFLANT</u>	<u>SUBLANT</u>
0	3	2	3	2
1	8		1	1
2	1	2	2	
3	4		1	
4	1	1		
5			3	
6				
7	1			
8				
9 +				1
	<u>18</u>	<u>5</u>	<u>10</u>	<u>4</u>

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job failure was based on analysis of service record entries. Identification of ways to prevent/reduce job failures focused on three methods: applicant screening, post-training job assignment, and on-the-job remedial assistance. Potential screening and assignment criteria were identified by examining four types of background data: (a) demographic characteristics, (b) context and type of duty assignments, (c) training background, and (d) performance history. The feasibility of more timely remedial technical assistance was explored using performance trends. Results indicated the prevalence of IDT job failure was estimated to be between 5 and 7% per year. Basic causes of performance-related relief were either inspection failures (38%), dishonorable conduct (32%), or problems in dealing effectively with superiors (30%). Expansion of current screening criteria could be justified on the basis of job-failure IDT corpsmen exhibiting significantly more pre-application instances of substandard performance and fewer instances of outstanding performance. Modification of assignment procedures could be justified on the basis of significant prediction of job failure based on IDT class standing. Earlier introduction of remedial technical assistance could be justified on the basis of deteriorating performance trends among ineffective corpsmen as early as three reports prior to job failure.

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